Mars Scout 2006
and
Missions of Opportunity

Preproposal Conference

MEP, AO Changes and Highlights,
Science Evaluation

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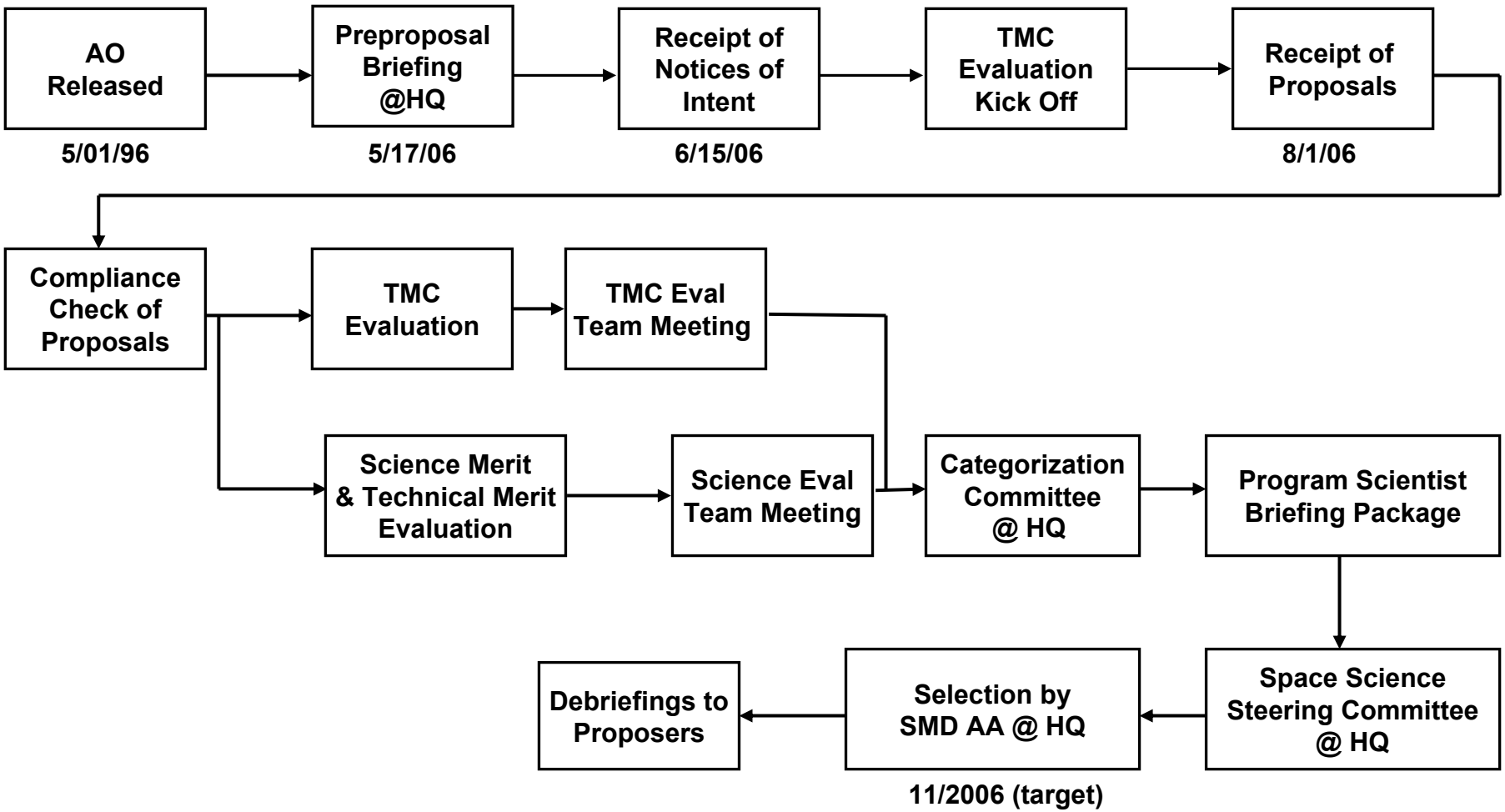
Mars Scout Proposal Evaluation Process



Mars Scout - Introduction

- "Mars Scout Mission investigations are characterized as complete space flight missions launched no later than January 31, 2012, on Expendable Launch Vehicles (ELVs) to Mars." "…Mars Scout Mission investigations are capped at $475M…in Fiscal Year 2006 dollars..." Section 1.1
- "Mars Scout Mission of Opportunity investigations are characterized as being conducted through a "parent" space mission of any size sponsored by any organization, domestic or foreign, other than NASA's MEP and having a total cost to MEP of no more than $35M FY 2006 dollars." Section 1.1
- The goals and objectives of the MEP are outlined on the next slide. "Mars Scout investigations must address at least one of the first three goals, and may additionally address the fourth goal." Section 3
- "Mars Scout MoO investigations must address one or more of the science objectives of the Mars Exploration Program (MEP) (Section 3) and must include appropriate provisions for the analysis of data and publication of results in the peer-reviewed scientific literature and for the conduct of an E/PO program." Section 6.13.1

Mars Scout Scientific Goals and Objectives of the MEP

"Goal 1. Determine whether life ever arose on Mars:

Objective 1 – Determine if life exists today.

Objective 2 – Determine if life existed on Mars in the past.

Objective 3 – Assess the extent of prebiotic organic chemical evolution on Mars.

Goal 2. Characterize the Climate of Mars:

Objective 1 – Characterize Mars' present climate and climate processes.

Objective 2 – Characterize Mars' ancient climate.

Goal 3. Characterize the Geology of Mars:

Objective 1 – Determine the geological processes that have resulted in formation of the Martian crust and surface.

Objective 2 – Characterize the structure, dynamics, and history of the planet's interior.

Goal 4. Prepare for human exploration of Mars:

Objective 1 – Acquire appropriate Martian environmental data such as radiation.

Objective 2 – Conduct *in situ* engineering and science demonstrations.

Objective 3 – Emplace infrastructure of relevance to future missions." Section 3.

Anticipated Results

- "Pending the submission of an adequate number of proposals of merit, NASA expects to select up to three Mars Scout Mission investigations through this AO, each of which will be awarded funding of $2M FY 2006 to conduct Phase A Concept Studies lasting up to nine months." Section 1.2
- "As a result of the evaluation of the Concept Studies, the Science Mission Directorate expects to authorize one Mars Scout mission investigation to proceed to Phase B through the exercise of an option under that team's existing contract with NASA." Section 8.4.3
- "NASA may select zero, one, or more Missions of Opportunity. Mission of Opportunity investigations may be selected with or without a Phase A Concept Study." Section 1.2

New in this AO
Selection Criteria

- "The evaluation criteria with their approximate percentage weights are as follows:" Section 8.2.1

	Selection	Downselect
The scientific merit of the proposed investigation;	40%	25%
The scientific implementation merit and feasibility of the proposed investigation; and	30%	25%
The feasibility of the proposed approach for mission/MoO implementation, including cost risk (i.e., realism and reasonableness of cost).	30%	50%

- "…the selection factors include Scientific Merit of the Investigation, Scientific Implementation Merit and Feasibility of the Investigation, and Feasibility of the Mission Implementation, Including Cost Risk, as well as additional selection factors. These additional selection factors include the MEP Cost as well as the merit of the EPO plan (including SC), SEO merit, and TDO merit." Section 8.3.1

Mission Categorization

"An *ad hoc* categorization subcommittee of the SMD AO Steering Committee (see further below), composed wholly of Civil Servants and Intergovernmental Personnel Act appointees (some of whom may be from Government agencies other than NASA) and appointed by the Associate Administrator for Science, will convene to consider the peer review results and categorize the proposals in accordance with procedures required by NASA FAR Supplement Part 1872. The categories are defined as follows:

- **Category I.** Well conceived and scientifically and technically sound investigations pertinent to the goals of the program and the AO's objectives, and offered by a competent investigator from an institution capable of supplying the necessary support to ensure that any essential flight hardware or other support can be delivered on time, and data that can be properly reduced, analyzed, interpreted, and published in a reasonable time. Investigations in Category I are recommended for acceptance and normally will be displaced only by other Category I investigations.
- **Category II.** Well conceived and scientifically or technically sound investigations that are recommended for acceptance, but at a lower priority than Category I.
- **Category III.** Scientifically or technically sound investigations that require further development. Category III investigations may be funded for development and may be reconsidered at a later time for the same or other opportunities.
- **Category IV.** Proposed investigations which are recommended for rejection for the particular opportunity under consideration, whatever the reason. " Section 8.1

New in this AO
Cost Definitions

- "The following terms are used throughout the AO to differentiate among the various methods of accounting for the cost of an investigation." Section 1.1

MEP cost	Costs to be funded by MEP, which must be equal to or less than the cost cap as defined in this AO.
Principal Investigator Cost	MEP cost minus ELV cost; portion of mission that is under PI management responsibility
Total Mission Cost	MEP Cost + Value of any contributions

New in this AO
Student Collaboration as Part of the E/PO Plan

- "Principal Investigators are encouraged to propose innovative Student Collaborations (SC) that inspire students, engage them directly in prospective missions, and contribute to the development of their education and work skills relevant to NASA missions." Section 6.8.2
- "Proposers may define an SC that involves development of an instrument, investigation of scientific questions, analysis and display of data, development of supporting hardware or software, and/or other aspects of the mission. The activities may involve flight or ground systems." Section 6.8.2
- "The proposer must clearly identify the proposed SC as an E/PO element." Section 6.8.2
- "If proposed, the proposer must provide details of the development schedule of the SC, including decision points for determining SC readiness." Section 6.8.2
- "…the proposer must describe how the SC will be planned so that the baseline science investigation is not compromised in the event that the SC component is not funded, encounters technical, schedule, or cost problems, or fails in flight." Section 6.8.2
- "…E/PO will be an integral element of the Mars Scout Program; 0.25 to 0.5 percent of the PI Cost (excluding launch vehicles) must be allocated to E/PO if a Student Collaboration (SC, see below) is not proposed. If an SC is proposed, then an amount greater than 0.5 percent of the PI Cost may be allocated to accommodate the SC." Section 6.8.1

New in this AO
Student Collaboration as Part of the E/PO Plan (concluded)

- …for a Student Collaboration, the educational merit of the implementation approach will be considered as part of this criterion (*Scientific Implementation Merit and Feasibility of the Investigation).* Section 8.2.3
- "The SC must be fully described in its impact to educational opportunities as well as technical, maturity, processes, and mission risks... The proposer must discuss how the experiment can be incorporated into the mission on a non-impact basis. The SC may have a separate 5 pages allocated to it to discuss its approach and implementation." Appendix B, Section E.
- "Student Collaboration proposals, if any, will be evaluated for overall merit and will not be penalized for any inherent higher cost, schedule, or technical risk, as long as the SC is shown to be clearly separable from the primary objectives per Section 6.8." Section 8.2.4
- "Although the cost of the SC must be included under the cost cap, the cost of the SC must be identified separately from the proposed investigation. If NASA selects the proposed mission, NASA may or may not fund the SC." Section 6.8.2
- "If an SEO, TDO, or SC is proposed, a separate line item for each must be clearly shown in Table B-1. This line must identify all additional costs to the mission to incorporate the SEO, TDO, or SC. If the investigation is selected but a given SEO, TDO, or SC is not, the amount on this line will be subtracted from the MEP cost." Appendix B, section I

New in this AO
Science Enhancement Opportunity (SEO) or Technology Demonstration Opportunity (TDO)

- "Mars Scout Missions could provide a platform of opportunity to fly a Science Enhancement Opportunity (SEO) or Technology Demonstration Opportunity (TDO) investigations to advance NASA's technology base. Therefore, proposers may define a SEO or TDO that may be an instrument, investigation, new technology, hardware, or software and may be demonstrated on either the flight system or ground system. The SEO or TDO must use innovative technological approaches to achieve the scientific goals of a mission. The use of innovative technologies that may have continuing applicability to future SMD missions is desirable." Section 6.12.4
- "Proposing a SEO or TDO is optional." Section 6.12.4
- "If an SEO, TDO, or SC is proposed, a separate line item for each must be clearly shown in Table B-1. This line must identify all additional costs to the mission to incorporate the SEO, TDO, or SC. If the investigation is selected but a given SEO, TDO, or SC is not, the amount on this line will be subtracted from the MEP cost." Appendix B, Section I
- "If NASA selects the proposed mission, NASA may or may not fund the SEO or TDO. If an SEO or TDO is proposed, it will be considered in selection." Section 6.12.4

New in this AO
(SEO) or (TDO) (continued)

- SEO and TDO Constraints:
  - "… it must be clearly separable from the proposed Baseline Mission investigation and the Performance Floor science investigation to the extent that it will not impact the proposed Baseline Mission investigation or minimum science mission if the SEO or TDO development has technical, schedule or cost problems, and either fails or is deleted from the mission. A description of future mission's potential benefits if the SEO/TDO is successful is also recommended. Section 6.12.4
  - "The proposer must clearly identify the proposed SEO or TDO and describe the innovative technology and/or the enhanced science return." Section 6.12.4
  - "The proposer must clearly identify the development schedule of the SEO or TDO and describe how it will be developed so as to be separable from the proposed baseline science investigation and performance floor." Section 6.12.4
  - "Review and decision points for determining the SEO or TDO readiness for flight must be identified." Section 6.12.4
  - "Backup plans for the SEO or TDO technology, if any, should be explained. " Section 6.12.4

New in this AO
(SEO) or (TDO) (continued)

"SEO OR TDO IMPLEMENTATION PLAN (OPTIONAL)" Appendix B, Section F

- "For the Mars Scout investigations proposing a SEO or TDO, up to 5 additional pages may be used to describe the SEO or TDO Implementation Plan. Within this subsection, specific topics to be addressed should include:
  - Describe the proposed SEO or TDO, the new technology and the current TRL;
  - Describe how this new technology would enable new scientific investigations or enhance the proposed investigation's science return and or its applicability to future SMD missions;
  - Identify the development schedule for the SEO or TDO and describe how it will be developed so as to be separable from the proposed baseline science investigation and performance floor;
  - Define the decision points for determining the SEO or TDO readiness for flight;
  - An estimation of the manpower, cost resources, and the schedule required to complete the SEO or TDO must be discussed and the cost clearly identified in Table B1;
  - Description of the proposed plan for bringing each of the identified items to a minimum of TRL 6, defined as "system/subsystem model or prototype demonstration in a relevant environment, space, or ground" by Confirmation Review (CR) at the end of Phase B (include discussion of simulations, prototyping, systems testing, life testing, etc., as appropriate); and
  - Backup plans, if any, should be described." Appendix B, Section F

New in this AO
(SEO) or (TDO) (continued)

- SEO and TDO Evaluation:
  - "If proposed, NASA will evaluate each SEO or TDO on its merit and feasibility. The evaluation of the merit of the proposed SEO or TDO includes an assessment of whether it provides an enhanced science return, an advance in NASA's technology base, uses innovative technology approaches to achieve the scientific goals, uses innovative technologies that may have continuing applicability to future SMD mission, or provides benefits to the baseline mission and future missions." Section 8.3.2
  - "An evaluation of the feasibility includes assessing whether the scope of the investigation is appropriate and follows the guidelines in section 6.12.4." Section 8.3.2
  - "The evaluation will also address whether the SEO or TDO it is clearly separable from the Baseline mission to the extent that it will not impact the proposed Baseline Mission if the SEO or TDO development or operation has technical, schedule, or cost problems, and is deleted from the mission or fails in flight." Section 8.3.2
  - "A separate cost must be provided for each proposed SEO or TDO. The likelihood of completing the proposed development for the proposed cost will be assessed. Section 8.3.2
  - The development plans, schedule and funding will be evaluated. The development schedule and risk management approach will be assessed to determine if the development is feasible and appropriate review and decision points are identified during development to assess whether further investment is warranted or is ready to proceed to the next milestone or flight. Section 8.3.2
- "This evaluation will result in narrative text as well as an adjectival score for each SEO or TDO." Section 8.3.2

New in this AO
Increased Emphasis on Cost

- "…the MEP Cost will be a significant factor in the final selection of Mars Scout investigations through this AO (see Section 8.1) and in the continuing assessment of ongoing Mars Scout investigations (see Section 8.4)." Section 6.10.1
- "There has been an increased emphasis on the responsibility and authority of the selected team and the implementing institution to accomplish the mission within the strict cost and schedule limits. Threats of noncompliance to committed requirements may trigger additional reviews and changes in the division of responsibilities." Forward
- "Mars Scout Mission investigations will also be subject to new Congressional requirements for cost and schedule overruns. Based on the cost cap at Mission Confirmation, the Program must notify the NASA Administrator if the development cost is likely to exceed the estimate (cost cap) by 15% or more, or if a baseline milestone is likely to be delayed by 6 months or more. At 30%, no additional funds may be expended other than termination costs without Congressional authorization... This does not negate the authority of NASA to consider a mission for termination anytime the baseline cost (set at Confirmation) is exceeded. If the mission is projected to exceed baseline cost by the PI, the implementing organization, or NASA, a remedial review or termination review may be called." Section 8.4.4

New in this AO
Increased Emphasis on Cost (Continued)

- "The MEP has become increasingly aware of the risks and Program-level impacts associated with cost overruns. The proposer should address the uncertainties in the baseline cost estimate by attributing a confidence level, and showing high and low cost values around the baseline appropriate to the level of uncertainty." Section 8.2.4
- "Experience in NASA's Discovery and Explorer Programs has shown that mission costs tend to grow in Phase A and beyond as costs and challenges are better understood; therefore, proposers are advised to allow for this cost growth in Phase A (by proposing well below the cost cap), so as not to exceed the Mars Scout Mission investigation cost cap." Section 6.10.1

New in this AO
Increased Emphasis on Cost (Continued)

- "A fully validated earned value management system as defined by ANSI/EIA-748-A, NPR 7120.5C (see particularly Section 3.4.3.2.a(2)), shall be applied to any project (contractor and civil service) exceeding $50 M total project cost." Section 6.10.1
- "NASA has recently established a Cost Analysis Data Requirement (CADRe) that will be applicable to investigations selected through this AO... The CADRe itself will not be considered as part of the evaluation. Actual development of the CADRe will be performed by support contractors funded directly by NASA HQ. Projects will only have to spend project funds on the minimal effort to collect existing documentation and transmit it to the CADRe support contractor, and then review the completed CADRe for completeness and accuracy." Section 6.10.4
- "…the total funding requirements for all Mars Scout Mission investigations selected through this AO must be compatible with the funding profile shown in Appendix E, which will necessarily govern expenditures by development phase." Section 6.12.6

New in this AO
Mission of Opportunity

- "The launch-by date has been changed to January 31, 2012, for Mars Scout missions and to December 31, 2013, for Missions of Opportunity (MoO). There is no longer a specific commitment date by NASA for U.S. participation in a Mission of Opportunity." Forward

- "NASA may select zero, one, or more Missions of Opportunity. Mission of Opportunity investigations may be selected with or without a Phase A Concept Study." Section 1.2

- "By supporting U.S. participation in MoO investigations, NASA seeks to allow the U.S. scientific community to conduct a science investigation of interest to MEP as part of missions sponsored by non-MEP organizations. Such non-MEP missions may be sponsored by non-U.S. governments, other U.S. agencies, NASA organizations other than MEP, the U.S. military (only if the satellite is not planned for weapons testing), or private sector organizations; all are equally qualified. Mars Scout MoO investigations may include providing a complete science instrument or providing hardware components of a science instrument sponsored by some organization other than NASA MEP. MoO proposals may allow Co-I participation on a foreign mission. MoO proposals for data purchase or data exchange for services are not allowed in this opportunity. MoO proposals for mission participation are allowed if conforming to policy of data deposition in PDS. The total cost to MEP for a Mars Scout MoO investigation, including all costs for DSMS support and/or NAIF services, through this AO is limited to $35M FY 2006 per investigation." Section 6.13.1

New in this AO
Launch Services

- "Mars Scout Mission investigations must be launched as a primary payload on an expendable launch vehicle (ELVs)." Section 6.12.2
- "ELVs must be provided by NASA... Foreign launch services may not be proposed as part of a teaming proposal with a non-U.S. partner." 6.12.2
- "If the investigation is selected for flight, NASA expects to contract with the appropriate U.S. launch-service provider to acquire the launch service for the investigation, and fluctuation of the cost of the launch vehicle will not be the responsibility of the PI once the mission is confirmed for flight." Section 6.12.2
- "Launch Service costs are part of the MEP cost, and the total $475 FY 2006 cost cap (the PI cost cap is the MEP cost minus the cost of the launch service)." Section 6.12.6

New in this AO
Contributions

- "Contributions, including services, from non-MEP U.S and non-U.S. sources are welcome. These may include, but are not limited to, contributions to the payload or to the spacecraft, subject to the following exceptions and limitations: (i) contribution of non-U.S. launch services of any kind are prohibited; (ii) non-U.S. nuclear power sources are prohibited; and (iii) … the sum of contributions of any kind to the entirety of the flight mission for a Mars Scout Mission investigation may not exceed one third (1/3) of the estimated MEP Cost in U.S. dollars." Section 6.10.3
- "Such contributions will not be counted against the cost cap, but they must be included in the calculation and discussion of the Total Mission Costs (Section 6.10.1)." Section 6.10.3
- "A Letter of Commitment that contains a statement of financial commitment from each responsible organization contributing to the investigation, signed by an official who is authorized to commit the resources of the organization, must be submitted with the proposals... Any proposal failing to provide Letters of Commitment from U.S. and non-U.S. partners with the submitted proposal may be judged noncompliant and returned." Section 6.10.3
- "For proposals offering contributions that are critical to the success of the proposed investigation, the evaluated risk will increase if the proposals: 1) do not have clear and simple technical and management interfaces in the proposed cooperative arrangements, 2) do not provide evidence in the proposal that the contribution is within the scientific and technical capability of the partner, and 3) do not have the required commitment to provide the offered contribution." Section 8.2.4

New in this AO
Use of Radioactive Materials

- "…radioisotope-based sources of electrical power requiring a substantial quantity of nuclear material, such as Multi-Mission Radioisotope Thermoelectric Generators (MMRTGs), are **not** permitted for missions proposed in response to this AO." Section 6.3.2
- "The use of smaller radioactive sources, such as radioisotope heater units (RHUs) or radioactive material sources for science instruments, is permitted." Section 6.3.2
- "…the cost of such devices must be included in the PI Cost and will count against the cap on the Mars Scout mission investigations..." Section 6.12.6
- "… this usage will require additional environmental review documentation consistent with NASA policy and procedures…" Section 6.3.2
- "All RHUs used in missions proposed for this AO, including the services associated with their provisioning on space missions… will be provided by NASA and the Department of Energy (DOE) as Government-Furnished Equipment (GFE) and Services (GFS). However, their costs must be included in the proposal as described in Section 6.10.1 of this AO." Section 6.3.2

New in this AO

More Emphasis on the Project Manager

- "A single PI must be designated in each proposal and is the central person in charge of each Mars Scout investigation, with full responsibility for its scientific integrity, for the integrity of all other aspects of the mission including the E/PO program, and for the execution of the investigation within the committed cost and schedule. The PI is responsible for assembling a team to propose and implement a Mars Scout investigation. The PI is accountable to NASA for the scientific success of the investigation and must be prepared to recommend project termination when, in his/her judgment, the successful achievement of established minimum science objectives, as defined in the proposal as the Performance Floor (see Section 6.12.3), is not likely to be achievable within the committed cost and schedule. The naming of a deputy PI is recommended. Even though the PI has ultimate responsibility for all aspects of the mission, the investigation's implementing institution, selected and overseen by the PI, has the responsibility to ensure that the mission meets schedule and cost constraints. Herein is the critical role of the Project Manager (PM) in overseeing the technical progress towards mission success." Section 6.6.1

New in this AO
More Emphasis on the Project Manager (continued)

- "Each Mars Scout investigation proposal must have a fully qualified and experienced Project Manager (PM) who will oversee the technical implementation of the project. This PM must be named at the time of proposal. The role, availability, qualifications, and experience of the PM must be adequate to ensure that the technical and managerial needs of the investigation will be met. A deputy PM is strongly recommended. Furthermore, it is the PM and the implementing institution's responsibility to provide the quality personnel and resources necessary to meet the technical and managerial needs of the mission. Any replacement of key personnel (including but not limited to the PI, PM, deputy PI, deputy PM, industry lead, and instrument leads) requires concurrence by NASA. Furthermore, the PM must be approved at each transition to the next Phase." Section 6.6.2
- "Once an investigation has been selected for flight, failure to maintain reasonable progress on an agreed upon schedule and cost, or failure to operate within the constraints outlined in this section, would generate a remedial review to examine root causes, to delineate the division of responsibility and authority between PI and SMD/MEP, to make any changes in management structure or key personnel, and determine if any remedial action is warranted to increase confidence in the ability to operate within constraints. Furthermore,… exceeding the cost or schedule constraints may be cause for mission termination by NASA." Section 6.1

New in this AO
Letters of Committment

- "NASA requires Letters of Commitment from the following participants in the investigation:"
  - "Any U.S. organization, including other Government agencies, or non-U.S. organization that is offering to contribute critical facilities… goods,… and/or services. The letter must include the approximate value of the contribution…."
  - "Any U.S. organization, including other Government agencies, or non-U.S. organization that is offering to contribute the time and/or services of Co-Investigators, including E/PO participants. The letter must include the amount of the contribution…. "
  - "Any prime contractor, major subcontractor, or other participant that is named in the proposal and will provide critical hardware, facilities, goods, or services, whether contributed or not. The letter must include… a commitment to perform the work as proposed and for the cost proposed…. "
  - NASA or Government providers for services and/or facilities offered in the AO for which resources are limited, such as the DSN. The letter must include an acknowledgement of both the quantity and timing of resources required for the proposed effort, as well as the estimated cost of these resources…"

"These letters must provide evidence that the senior officials authorized to commit the participating institutions and/or appropriate Government officials are aware and supportive of the proposed investigation and will provide funding for their stated participation in the investigation if it is selected by NASA. The letters must be signed by officials authorized to commit those organizations as proposed. Failure to provide such Letters of Commitment from all parties involved in the proposal can be reason for declaring the proposal noncompliant and returned without review." Appendix B, Section J.2

New in this AO
Letters of Committment

- "…NASA requires a Letter of Commitment from every Co-I identified as a participant in the proposal's cover page and/or in the text of the proposal… It must be addressed to the PI… and be signed by the individual Co-I." Appendix B, Section J.2
- "If contributed…a Letter of Commitment from the proposed Co-I's institution must be provided with the proposal..." Section 6.7
- "Letters of commitment are required for all science team members identified in the science section (including the PI and Co-Is) and elsewhere in the proposal." Section 7.3.2
- "… note that failure to provide all letters of commitment may result in the proposal being declared noncompliant." Section 6.7

Other AO Highlights

- …the Performance Floor…is defined as the minimum science return below which the investigation will not be considered justifiable for the proposed cost." Section 6.12.3
- "The Performance Floor must be identified and documented for a proposed Mars Scout Mission investigation, along with a plan for the prioritized descoping of mission capability from the Baseline to the Performance Floor, in the event of cost or schedule growth or for risk mitigation." Section 6.12.3
- "Investigations proposing new technology, i.e., technologies having a Technology Readiness Level (TRL) less than 6 (see *TRL Definitions* in the Mars Scout Library), will be penalized for risk if adequate backup plans to ensure success of the mission are not described." Section 8.2.4
- "Mars Scout investigations will also be subject to the established protocols that address forward and back contamination." Section 6.2.3
- "…mission teams…must plan to obtain Independent Verification and Validation (IV&V) from the NASA IV&V Facility in Fairmont, West Virginia, for all flight and ground software... Each proposal must verify that they will obtain IV&V services from this NASA Facility... NASA covers cost of these required IV&V activities." Section 6.3.1

Other AO Highlights

- …the MEP requires that missions with more than one Mars year of expected life in Mars orbit must carry a UHF communications package… to provide telecommunications support for data relay for future missions and to provide support during critical events... Scout orbiter missions required to carry such a UHF relay will have it provided as GFE at no cost to the proposer, although its integration into the payload will be the responsibility of the proposer (PI cost)." Section 6.4
- "The MEP requires that Scout missions plan for and provide critical event data that can be recovered for adequate anomaly reconstruction should one occur." Section 6.5

AO HIGHLIGHTS (Sample Return)

- "All samples of extraterrestrial planetary materials returned by Mars Scout Missions are NASA property… and must be delivered to and processed by the NASA Astromaterials Curatorial Facility located at NASA's Johnson Space Center (JSC)…" "The actual costs for all aspects of curation from planning through distribution and storage will be borne by the mission from inception to two years following sample return." Section 6.2.2
- "…a fraction of the total returned sample may be forwarded to the national curatorial facility of the contributing country within six months after return to the NASA Astromaterials Curatorial Facility. It is expected that the amount of sample so transferred will be no more than 25%. Any material allocated to foreign members of the Science Team during the preliminary examination period shall be included in this 25% limitation." Section 6.2.2
- "The terms and conditions of selection of a sample fraction for transmission to the contributing country must be specified in the mission proposal. However, in the event that the mission is selected, the final arrangements for the transfer of a fraction of the sample to the contributing country must be established through an exchange of letters or a Memorandum of Understanding (MOU) between NASA (with approval of the Astromaterials Curator) and the contributing foreign participant." Section 6.2.2

New in this AO
Increased Emphasis for Phase A

"With the increased funding of $2M per selected proposal and increased time of nine months to conduct a Phase A and provide the Concept Study report, NASA expects a higher level of fidelity and reliability in the Phase A cost proposal than in previous responses to AOs, including delineation of the confidence levels of baseline estimates, providing high and low values commensurate with the estimate uncertainties, and an evaluation of cost risk." Section 8.4.3

"Past performance of the partners in the implementation of previous or current space missions, particularly cost capped missions such as NASA's Explorer or Discovery missions, will be one of the factors used in assessing cost risk, schedule risk, and the risk of failure in technical and managerial performance. Note that, even with innovative cost features, selected investigations that are unable to show adequate unencumbered reserve commensurate with mission risk at the time of their confirmation for development (i.e., at the end of Phase B,for all development costs in Phases C and D excluding ELV) are likely to be judged as having an unacceptably high cost risk and, therefore, may not be confirmed for further development." Section 8.4.3